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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,974	02/08/2002	Lhing-Yew Li		3799

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EXAMINER	
KERR, KATHLEEN M	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,974	LI ET AL.	
	Examiner	Art Unit	
	Kathleen M Kerr	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/20/02, 5/29/03*, 9/24/02, 6/3/03, 10/31/02
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☑ Other: Taxonomy Browser

DETAILED ACTION

Application Status

1. In response to the previous Office action, a written restriction requirement (mailed on November 10, 2003), Applicants filed an election received on November 21, 2003. Thus, Claims 1-25 are pending in the instant Office action.

Election

2. Applicants' election with traverse of Group I, Claims 1-23 and 25, in a paper received in November 21, 2003 is acknowledged. The traversal is on the ground(s) that no serious search burden exists for the two Groups to be examined together. This is not found persuasive because, in fact, the classification is different, wherein the two Groups are in different subclasses that would require distinct, non-overlapping searches. As Applicants point out, separate classification is grounds for search burden (see M.P.E.P. § 803).

The requirement is still deemed proper and is therefore made FINAL. Claims 1-25 are pending. Claim 24 is withdrawn from consideration as a non-elected invention. Claims 1-23 and 25 will be examined herein.

Priority

3. The instant application is granted the benefit of priority for the U.S. Provisional Application No. 60/267,183 filed on February 8, 2001 as requested in the first lines of the specification and in the application data sheet. The Examiner notes that the provisional has support only for Claim 25 (not Claims 1-23) of the elected claims.

Information Disclosure Statement

4. The information disclosure statements (five in all) filed as noted below have been reviewed, and their references have been considered as shown by the Examiner's initials next to each citation on the attached copy.

a) Filed June 3, 2003
b) Filed May 29, 2003
c) Filed October 31, 2002
d) Filed September 24, 2002
e) Filed September 20, 2002, "AT" reference has been crossed out as a duplicate (signed on the IDS of 6/3/2003).

Compliance with the Sequence Rules

5. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. § 1.821(a)(1) and (a)(2). However, this application fails to **fully** comply with the requirements of 37 C.F.R. § 1.821 through 1.825; Applicants' attention is directed to the final rulemaking notice published at 55 FR 18230 (May 1, 1990), and 1114 OG 29 (May 15, 1990).

a) In Figure 10, a consensus sequence is disclosed without benefit of a SEQ ID NO.

b) On page 29, paragraph [0105], 8 sequences are disclosed with benefit of SEQ ID NOs.

If the noted sequences are in the sequence listing as filed, Applicants must amend the specification to identify the sequences appropriately by SEQ ID NO. If the noted sequences are not in the sequence listing as filed, Applicants must provide (1) a substitute copy of the sequence listing in both computer readable form (CRF) and paper copy, (2) an amendment directing its entry into the specification, (3) a statement that the content of the paper and CRF copies are the same and, where applicable, include no new matter as required by 37 C.F.R. § 1.821 (e) or

1.821(f) or 1.821(g) or 1.821(b) or 1.825(d), and (4) any amendment to the specification to identify the sequences appropriately by SEQ ID NO.

Objections to the Specification

6. The specification is objected to because the title is not descriptive. A new title is required that is clearly indicative of the invention to which the elected claims are drawn (see M.P.E.P. § 606.01). The Examiner suggests the following new title:

---Polynucleotide Constructs Encoding Aspartate Kinase, Aspartate-Semialdehyde Dehydrogenase, and Dihydrodipicolinate Reductase and Related Constructs, Products, and Methods---

7. In the specification, the Abstract is objected to for not completely describing the disclosed subject matter (see M.P.E.P. § 608.01(b)). It is noted that in many databases and in foreign countries, the Abstract is crucial in defining the disclosed subject matter, thus, its completeness is essential. The Examiner suggests the inclusion of the species of the embodiments, namely how the genes are from *C. glutamicum* and production of lysine in *C. glutamicum* is envisioned for completeness.

8. The specification is objected to for being confusing with respect to the sequence listing. The sequence listing contains 25 sequences as originally filed. Every SEQ ID NO is mentioned in the specification and/or the claims except SEQ ID NOs: 16-25. It is unclear why said sequences are in the sequence listing if they are not described in the specification. All SEQ ID

NOs in the sequence listing must be described in the specification. Appropriate correction is required.

Objections to the Claims

9. Claims 7-11 are objected to for a typographical error. The word "*lactovermentum*" is misspelled; the correct spelling is ---*lactofermentum*--- as found elsewhere in the claims and throughout the specification and the art. Correction is required.

Claim Rejections - 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-23 and 25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Unlike "ask" for **as**partate **k**inase and "asd" for **a**spartate-**s**emialdehyde **d**ehydrogenase, abbreviations dapB, lysA, dapA, dapD, dapE and dapF are unclear as to what, if any, limitations they impart. These abbreviations are gene names that are assigned in the art, usually consistently, when gene function is identified. However, in some cases when gene function is not assigned or is assigned properly, improper abbreviations are used. Like in the case of succinyl-diaminopimelate desuccinylase (dapE) that is E.C. 3.5.1.18. Often, genes encoding this desuccinylase are labeled dapE, but sometimes they are labeled ytjP (*Bacillus subtilis*) or pepV (*Streptococcus mutans*) or argE2 (*Thermoanaerobacter tengcongensis*). Thus, it is unclear if these claims mean to limit to only those species of enzyme wherein the gene name

is "properly" assigned or if merely the enzyme name is all that is required. Clarification is required.

11. Claims 2-6, 9-11, and 13-15 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In Claims 2-4, the term "truncated" is used to describe a ddh polypeptide or an ORF2 polypeptide; however, no limitation on the amount of truncation is noted. While the specification teaches specific truncations of species ddh and ORF2 polypeptides, these terms cannot be limited to these species from the specification without the limitations directly in the claims. The truncation adjective can render the claim to read on as little as a single amino acid of a ddh or ORF2 polypeptide, which would no longer be a *poly*peptide, but an amino acid. Thus, the metes and bounds of the truncation is confusion. Clarification is required.

12. Claims 4-6, 10, 11, 14, and 15 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "ORF2" polypeptide is unclear as to its meaning. All the other polypeptides in the claims are well-known enzymes in the art whose names denote a particular structure. This is not the case of ORF2 polypeptides. The nature of the genus is wholly unclear except for the species that is described by SEQ ID NOs: 9/10. Clarification of the metes and bounds of the genus is required.

13. Claims 7 and 9-11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "encoded by *Corynebacterium* ..." is unclear because genes encode polypeptides, bacteria natively comprise these encoding genes. Is this phrase meant to limit to the SEQ IDs in the specification that are species of the genes obtained from Corynebacterium (see page 5 or the sequence listing)? Or is this phrase meant to limit to any ask gene native to Corynebacterium, for example? Clarification is required.

14. Claim 8 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "wherein said ask and asd polypeptides are encoded by the ask-asd operon of ATCC21529" is unclear as to the limitations it adds to the claim. As written, the broadest interpretation seems to be that this phrase merely defines the polypeptides (encoding SEQ ID NOs:2 and 4) and does not require the entire operon to be present in the claimed polynucleotide or even that the exact DNA (SEQ ID NOs: 1 and 3) be present. However, it also seems reasonable that Applicants are claiming the species they used, which does in fact use the entire operon. Clarification is required.

15. Claims 7 and 9-11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Group of "*Corynebacterium*, *Brevibacterium flavum*, and *Brevibacterium lactofermentum*" is confusing. *Corynebacterium* is a genus name, which genus includes the species *Brevibacterium flavum* and *Corynebacterium glutamicum* whose synonym is

Brevibacterium lactofermentum (see attachment from the Taxonomy Browser). Thus, the members of the Group are not distinct from each other and are confusing as such. Clarification is required.

16. Claim 20 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The inclusion of *Brevibacterium lactofermentum* and *Corynebacterium glutamicum* in the Group is confusing since these are considered different names for the same species (see attachment from the Taxonomy Browser).

17. Claim 25 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "succinylaminoketopimelate transaminase (dapC)" is unclear. In enzymes databases, the enzyme succinyldiaminopimelate transaminase (or aminotransferase) is found as E.C. 2.6.1.17, and some of its attributed gene names are "dapC"; however, it is unclear if this enzyme function is intended since the enzyme name is not known in the art. Clarification is required.

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

18. Claims 4-6, 10, 11, 14, and 15 are rejected under 35 U.S.C. § 112, first paragraph, written description, as failing to comply with the written description requirement. The claim(s) contains

subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The description of "ORF2 polypeptides" is based solely on the disclosure of a single species, SEQ ID NO:10.

The Court of Appeals for the Federal Circuit has recently held that a "written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as be structure, formula [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 1997 U.S. App. LEXIS 18221, at *23, quoting Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) (bracketed material in original). To fully describe a genus of genetic material, which is a chemical compound, applicants must (1) fully describe at least one species of the claimed genus sufficient to represent said genus whereby a skilled artisan, in view of the prior art, could predict the structure of other species encompassed by the claimed genus and (2) identify the common characteristics of the claimed molecules, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these.

In the instant specification, a gene encoding ORF2 polypeptide is described as any DNA encoding SEQ ID NO:10. No description of the features necessary, other than the complete SEQ ID NO:10, are described for ORF2 polypeptides. No activity of ORF2 polypeptides is described. These genes are only described according to the name of the polypeptide they encode; no structural or functional relationship is described or used in the claims or the specification. Thus,

one of skill in the art would be unable to predict the structure of other members of this genus by virtue of the instant disclosure.

19. Claims 8 and 12-15 are rejected under 35 U.S.C. § 112, first paragraph, written description, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The description of genes from particular operons and/or cells lacks any specific structure, although said structure is implied. In each case, specific SEQ ID NOs for the polypeptides are disclosed (see page 5 of the specification). However, the claims are drawn to the polypeptide as encoded by a dapB gene NRRL-B11474. If SEQ ID NO:5 isn't the protein encoded in said host cell, the specification lacks description of the product, which is a species that requires specific structural and functional limitations. The Examiner suggests amending these claims to limit to specific SEQ ID NOs disclosed and not gene encoded by specific host cells.

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

20. Claims 1-23 are rejected under 35 U.S.C. § 102(e) as being anticipated by Li *et al.* (WO 01/49854 – see IDS). The instant claims are drawn to a polynucleotide encoding aspartate kinase (ask, SEQ ID NO:2), aspartate-semialdehyde dehydrogenase (asd, SEQ ID NO:4), dihydrodipicolinate reductase (dapB, SEQ ID NO:6), diaminopimelate dehydrogenase (ddh, SEQ ID NO:8), ORF2 (SEQ ID NO:10), and diaminopimelate decarboxylase (lysA, SEQ ID NO:12), wherein SEQ ID NO:15 (a P1 promoter) is linked to lysA. Transformed *C. glutamicum* and *E. coli* cells as well as prokaryotic and eukaryotic cells are also encompassed.

Li *et al.* teach combination vector constructs containing ask, asd, dapB, ddh, ORF2, and lysA having the appropriate sequences required (see table on page 46). Li *et al.* specifically teach a combination vector comprising ask, asd, dapB, ddh, P1, and lysA transformed into *C. glutamicum* NRRL-B11474 (see page 64). Li *et al.* teach using various host cells, such as B. flavum, *E. coli*, fungal and yeasts cells with their disclosed vectors (see pages 8 and 43) and various methods of transformation that include integration and extra-chromosomal vectors (see page 25).

21. Claims 1-4, 7-18 and 20-21 are provisionally rejected under 35 U.S.C. 102(e) as being anticipated by Hanke *et al.* (U.S. Application 09/722,441, now allowed).

The applied reference has a common inventor with the instant application, Lhing-Yew Li of Savoy, IL is Lhing-Yew Li-D'Elia of the same. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. § 102(e). This rejection under 35 U.S.C. § 102(e) might be overcome either by a showing under 37 C.F.R. § 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this

application and is thus not the invention "by another," or by an appropriate showing under 37 C.F.R. § 1.131.

Allowed claims of 09/722,441 are species of some claimed genera in the claims of the instant application as follows:

Allowed claims of 09/722,441	Pending claims of 10/067,974
21	1-4 and 7-15
24-25	16
26	17
27	18, 20
28	21

The species allowed in 09/722,441 anticipate the genus claimed in 10/067,974.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 C.F.R. § 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 C.F.R. § 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 C.F.R. § 3.73(b).

22. Claims 1-4, 7-18 and 20-21 are provisionally rejected under the judicially created doctrine of double patenting over claims 21 and 24-28 of copending Application No. 09/722,441.

This is a provisional double patenting rejection since the conflicting claims have not yet been patented; however, the claims of 09/722,441 have been allowed and are awaiting issue.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as noted above in the rejection under 35 U.S.C. § 102(e).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also M.P.E.P. § 804.

Conclusion

23. Claims 1-23 and 25 are not allowed for the reasons identified in the numbered sections of this Office action. Applicants must respond to the objections/rejections in each of the numbered sections in this Office action to be fully responsive in prosecution.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen M Kerr whose telephone number is (571) 272-0931. The examiner can normally be reached on Monday through Friday, from 9:00am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathupura Achutamurthy can be reached on (571) 272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kathleen M Kerr
Examiner
Art Unit 1652

February 9, 2004